

## SMART 3.1

# Evaluation report (detail)

Appl. No | 09326891

Patent No | 06397367

Title of The Invention | device and methods for channel coding and rate matching in a communication system

Name of Applicant | Samsung Electronics, Co., Ltd.

Name of Assignee | SAM SUNG ELECTRONICS CO., LTD., KOREA, REPUBLIC OF

Evaluation Date | 2014-03-24

Generation Date | 2014-04-08

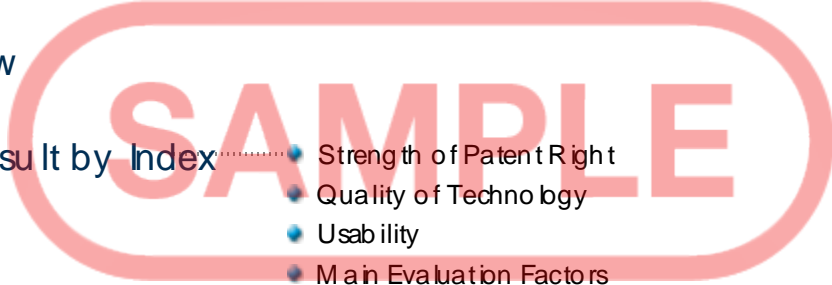
### Matters that Required Attention

- The results included in this report have been computed by a patent analysis evaluation system of Korea Invention Promotion Association. The scores, grades, and the other information included in the report are computed using statistical methods, and they are calculated based on public data of 2014-01 Korea Intellectual Property Office, Doc information and etc. The report generated in this system does not give legal opinions, professional opinions, advices or the like, and it should not be regarded that it has been generated based on such legal or professional opinions. The scores and grades included in the report are estimated values for deciding continuation of patent registration maintenance, and it is not related to real market value, royalty rate, validation or infringement of patents. In addition, no one can rely upon this report to verify or prove aforementioned information.
- The report does not give legal advice. The information included in the report is accurate only to the extent of knowledge of Korea Invention Promotion Association. However, Korea Invention Promotion Association does not guarantee that the information included in the report is perfect and accurate for any particular purpose. We recommend obtaining advice from a legal counsel or a financial expert prior to using the information included in the report.

Title of The Invention : device and methods for channel coding and rate matching in a communication system  
 Appl.No : 09326891 Patent No : 06397367  
 Evaluation Model : electric/electronic/IT

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### Summary of Patent

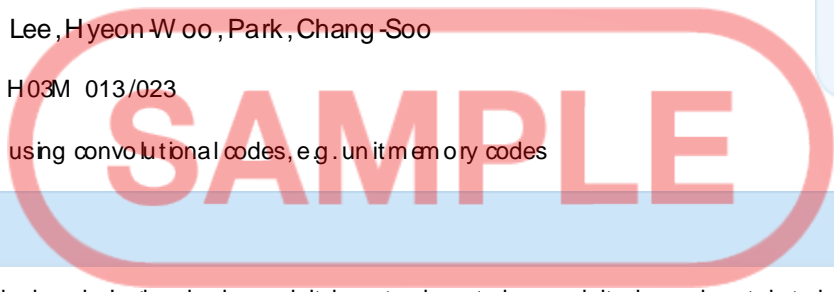
- Title of the invention : device and methods for channel coding and rate matching in a communication system
- Appl.No : 09326891
- Patent No : 06397367
- Filing Date / Patent Date : 1999.06.07 / 2002.05.28
- Applicant : Samsung Electronics, Co., Ltd.
- Assignee : SAM SUNG ELECTRONICS CO., LTD., KOREA, REPUBLIC OF
- Inventor : Lee, Hyeon-Woo, Park, Chang-Soo
- International Patent Classification Code : H03M 013/023
- International Patent Classification Name : using convolutional codes, e.g. unit memory codes

SCORE

**77.7**

GRADE

**AAA**



#### ■ Abstract

A channel coding device is disclosed. In the device, a bit inserter inserts known bits in an input data bit stream at predetermined positions. A channel coder codes the bit-inserted data bit stream to generate coded symbols. A rate matcher matches a rate of the coded symbols to a given channel symbol rate. A channel interleaver interleaves the rate matched channel symbols. The rate matcher includes a puncturer for puncturing the inserted known bits included in the coded symbols when the coded symbol rate is higher than the given channel symbol rate. The rate matcher includes a repeater for repeating the coded symbols to match the coded symbol rate to the given channel symbol rate when the coded symbol rate is lower than the given channel symbol rate.

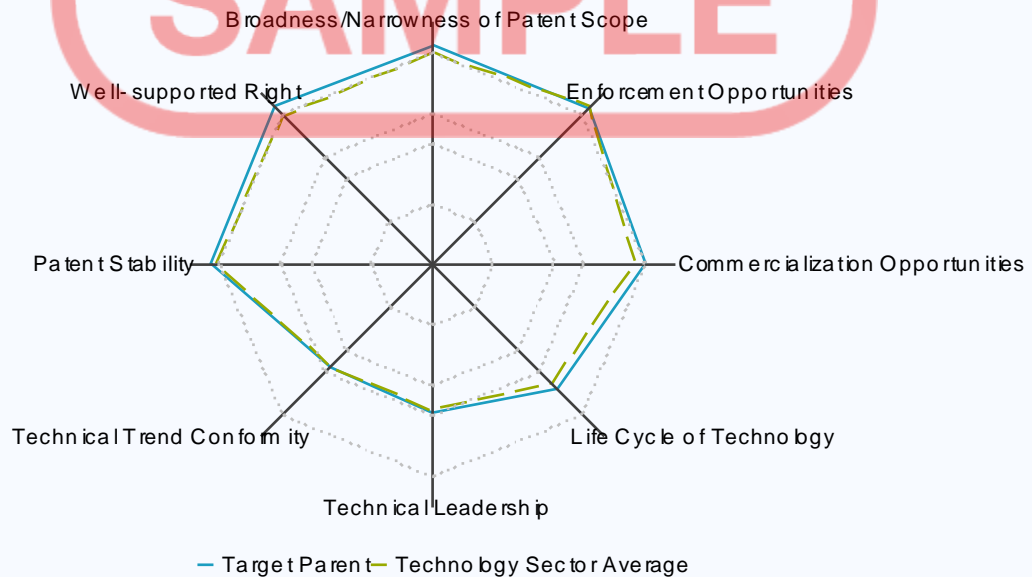
#### ■ Representative Claim

1. A channel coding device comprising: a bit inserter for inserting known bits in an input data bit stream at predetermined positions; a channel coder for coding the bit-inserted data bit stream to generate coded symbols; a rate matcher for matching a rate of the coded symbols to a given channel symbol rate; and a channel interleaver for interleaving the rate matched channel symbols.

Title of The Invention : device and methods for channel coding and rate matching in a communication system  
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### Overall Evaluation Analysis

Evaluation Items	Score	Grade	Big Division (electric/electronic/IT)			Middle Division (electric/electronic/IT)			Small Division (basic communication process)		
			Percent (%)	Average	Standard Deviation	Percent (%)	Average	Standard Deviation	Percent (%)	Average	Standard Deviation
Strength of Patent Right(40)	29.1	AAA	4.0	24.9	2.6	4.0	24.9	2.6	2.6	24.9	2.5
Quality of Technology(20)	17	AAA	2.8	15.1	0.9	2.9	15.1	0.9	1.1	15.1	0.9
Usability(40)	31.6	AAA	2.9	28.4	1.7	2.9	28.4	1.7	2.1	28.4	1.5
Total(100)	77.7	AAA	1.6	68.4	3.9	1.6	68.4	3.9	0.9	68.3	3.6



Percentage(%): position on percentage about rank of evaluation point in the same technical field

### Overall Review

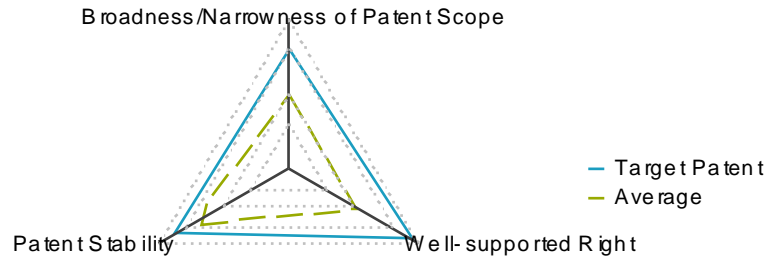
The overall evaluation score of Patent No. 06397367, "Device and methods for channel coding and rate matching in a communication system" is 77.7 point and AAA grade is assigned to it. The patent has scored 29.1 point in the Strength of Patent Right, 17.0 point in the Quality of Technology, and 31.6 point in the Usability, each of which has scored higher than the average scores of electric/electronic/IT (24.9 point in the Strength of Patent Right 15.1 point in the Quality of Technology, and 28.4 point in the Usability.) (See the table at the top). The patent is evaluated highly in the Usability, especially as 31.6 point, and comparatively lowly in the Quality of Technology as 17.0 point.

Title of The Invention : device and methods for channel coding and rate matching in a communication system  
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### Evaluation Result by Index

#### Strength of Patent Right (40 points)

Middle Division	Score	Average
Broadness/Narrowness of Patent Scope	16.0	14.5
Well-supported Right	16.7	14.6
Patent Stability	-3.7	-4.2
<b>Total</b>	<b>29.1</b>	<b>24.9</b>

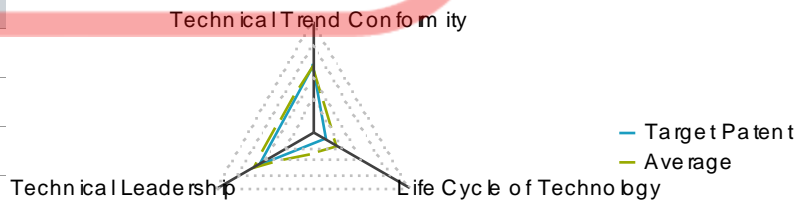


The evaluation score in the Strength of Patent Right is "29.1" and Grade "AAA" is assigned to it. The patent is evaluated highly as the evaluation scores are 16 in "Broadness/Narrowness of Patent Scope" and 16.7 in "Well-supported Right". The patent has a large number of claims (38 claims) and it has secured right on various views of technologies. Reissue was accomplished, and thus it is assumed that right scope is stronger.

\* Strength of Patent Right as an evaluation factor means the degree of satisfaction in the variable characteristics (breadth of patent right, degree of completion of right, validity/ sustainability of patent right and etc.) required to be the high quality patent. Patent right having broad and multifaceted scope of protection without limitation of enforceability is normally regarded as patent right of high quality.

#### Quality of Technology (20 points)

Middle Division	Score	Average
Technical Trend Conformity	3.9	3.9
Technical Leadership	4.3	3.7
Life Cycle of Technology	8.8	7.5
<b>Total</b>	<b>17.0</b>	<b>15.1</b>

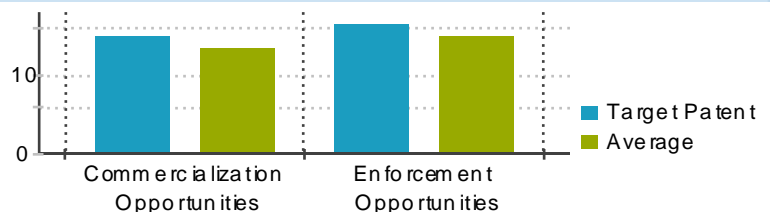


The evaluation score in the Quality of Technology is "17" and Grade "AAA" is assigned to it. The evaluation scores are 3.9 in "Technical Trend Conformity" and 4.3 in "Technical Leadership", which are comparatively high. It includes variable technical viewpoints as the number of PC is 5. The patent has 88 forward citations in later-filed patent applications, and it has been cited in the patent application filed maximum 4978 days from the filing date of this patent.

\* Quality of Technology as an evaluation factor means the degree of satisfaction in the variable characteristics required for the technologies disclosed in a patent to be in a comparatively superior position in a patent group of related technical field. It is a patent of high quality technology that technologies disclosed in the patent comply with technology trend, are in a leading position among patents of oneself or others, and are in continual use.

#### Usability (40 points)

Middle Division	Score	Average
Commercialization Opportunities	15.1	13.4
Enforcement Opportunities	16.5	14.9
<b>Total</b>	<b>31.6</b>	<b>28.4</b>



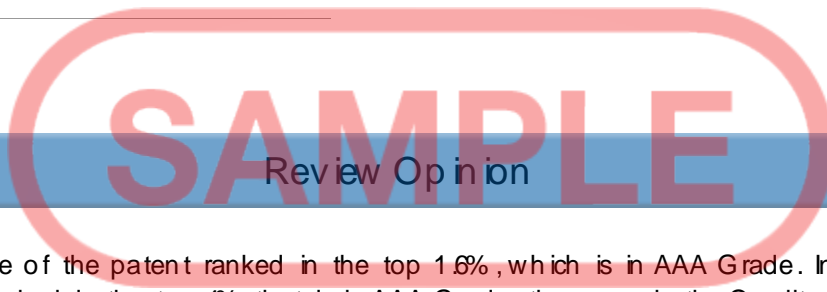
The evaluation score in the Usability is "31.6" and Grade "AAA" is assigned to it. The evaluation scores are 15.1 in "Commercialization Opportunities" and 16.5 in "Enforcement Opportunities", which are comparatively high. Reissue indicates that the patent holder desires to obtain a strong patent. It has 17 foreign family patent applications that form foreign patent network. Detailed review for determining if the closely related later filed patent has designed around the target patent is necessary, despite that the target patent was cited by the later filed patent as prior art, with there are 88 issued later filed patents. For your reference, we cannot rule out the possibility for a third party to commercialize products without infringing the target patent whose independent claims were drafted concisely, but have many claim limitations.

\* Usability of patent as an evaluation factor means the degree of satisfaction in variable characteristics required for the technologies disclosed in a patent to be widely-utilized. It is a patent of high usability where it is difficult for others to design around the patent scope, as a result, the patent is widely used by the patentee or third parties so that the patentee has no difficulty in enforcement.

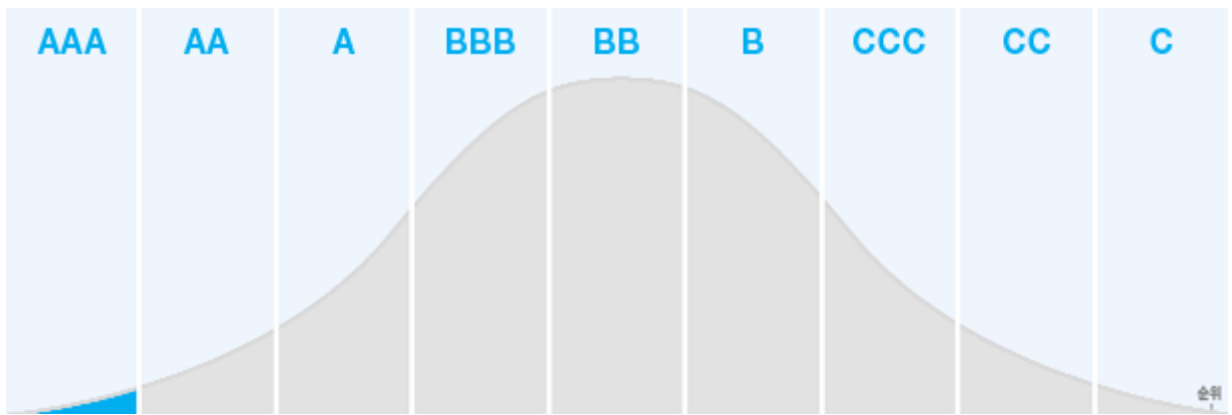
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### Main Evaluation Factors

Evaluation Factor	Evaluation Factor Value	Evaluation Factor	Evaluation Factor Value
Number of Independent Claim	6	Number of IPC	5
Number of Dependent Claim	32	Reexamination	0
Number of family patents in the USA	2	Reissue	2
Number of foreign family patents	17	Certification of Correction	0
Total number of backward citations	88	Litigation	0



The overall evaluation score of the patent ranked in the top 1.6%, which is in AAA Grade. In detail, the score in the Strength of Patent Right ranked in the top 4% that is in AAA Grade, the score in the Quality of Technology ranked in the top 2.8% that is in AAA Grade, and the score in the Usability ranked in the top 2.9% that is in the AAA Grade. In particular, The number of forward citations is 88 and it has been cited in later-filed patent applications. It has a large number of claims (38 claims) and has secured right on various views of technologies. It has right of claims in the multiple categories.



Grade	AAA	AA	A	BBB	BB	B	CCC	CC	C
Percentage (%)	4.0%	7.0%	12.0%	17.0%	20.0%	17.0%	12.0%	7.0%	4.0%
Accumulation Rate (%)	4.0%	11.0%	23.0%	40.0%	60.0%	77.0%	89.0%	96.0%	100%

Score-based grades are assigned based on the percentage of all registered patents according to the above grade distribution table.

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## Main patent information

### Ownership Change Information

No	Owner	Date of change
1	SAM SUNG ELECTRONICS CO., LTD., KOREA, REPUBLIC OF	1999.06.07

### Related Invalidation Action

No	Kind	Content	Date
1	re issues	Reissue Application filed Ex.Gp.:2133;Re.SN.10/967,119	2004.10.15
2	re issues	This patent was re issued as Reissue Patent RE 41,498 (O.G. August 10, 2010)	2010.08.10

### Family Information

No	Family patent number	Filing date	Country	Family type
1	WO9965148A1	1999.12.16	World Intellectual Property Organization (WIPO) (International Bureau of)	Foreign Family
2	KR1020000005958A	2000.01.25	Republic of Korea	Foreign Family
3	EP1027772A1	2000.08.16	European Patent Office (EPO)	Foreign Family
4	BRP 9906479A	2000.09.26	Brazil	Foreign Family
5	CN1272252A	2000.11.01	China	Foreign Family
6	KR100334819B1	2002.05.02	Republic of Korea	Foreign Family
7	US6397367B1	2002.05.28	United States of America	USA Family
8	JP2002518870A	2002.06.25	Japan	Foreign Family
9	JP2002518870T	2002.06.25	Japan	Foreign Family
10	JP3415120B2	2003.06.09	Japan	Foreign Family
11	RU2212102C2	2003.09.10	Russian Federation	Foreign Family
12	CN1148882C	2004.05.05	China	Foreign Family
13	CN1496011A	2004.05.12	China	Foreign Family
14	CN1496022A	2004.05.12	China	Foreign Family
15	DE29924886U1	2006.07.13	Germany	Foreign Family
16	CN100338885C	2007.09.19	China	Foreign Family
17	CN100466483C	2009.03.04	China	Foreign Family
18	USRE041498E	2010.08.10	United States of America	USA Family
19	BRP 9906479B1	2013.01.22	Brazil	Foreign Family

### Forward Citation Information

Title of The Invention : device and methods for channel coding and rate matching in a communication system

Appl.No : 09326891

Patent No : 06397367

Evaluation Model : electric/electronic/IT

No	Patent No	Country	Title Of The Invention	Filing Date	Applicant	Assignee
1	US6166667A	U.S.	Selection of turbo or non-turbo error correction codes based on data type or length	1999.04.05	SAM SUNG ELECTRONICS CO. LTD	SAM SUNG ELECTRONICS CO., LTD., KOREA
2	US6081921A	U.S.		1997.11.20		
3	US5878085A	U.S.	Trellis coded modulation communications using pilot bits to resolve phase ambiguities	1997.08.15	SDCOM, INC.	MORGAN STANLEY & CO., INCORPORATED
4	US6141353A	U.S.	Subsequent frame variable data rate indication method for various variable data rate systems	1997.03.07	OKI TELECOM	OKI TELECOM
5	US5944849A	U.S.		1995.06.26		
6	US5436918A	U.S.		1992.08.14		

### Backward Citation Information

No	Patent No	Country	Title Of The Invention	Filing Date	Applicant	Assignee
1	US8359520B2	U.S.	Detection, avoidance and/or correction of problematic puncturing patterns in parity bit streams used when implementing turbo codes	2011.12.02	NTERDIGITAL TECHNOLOGY	NTERDIGITAL TECHNOLOGY
2	WO2012036754A	World Intellectual Property Organization (WIPO) (International Bureau of)		2011.02.14		
3	USRE043622E	U.S.	Method for matching rate in mobile communication system	2010.07.21	LG ELECTRONICS INC.	LG INFORMATION & COMMUNICATIONS, LTD
4	US20110310855A	U.S.		2010.06.18		
5	US7899016B2	U.S.	Physical layer processing for a wireless communication system using code division multiple access	2010.04.12	NTERDIGITAL TECHNOLOGY	NTERDIGITAL TECHNOLOGY
6	US7987410B2	U.S.	Systems and methods for decreasing latency in a digital transmission system	2010.02.25	XOCYST TRANSFER AG LLC.	INTELLECTUAL VENTURES I, LIMITED LIABILITY COMPANY
7	US8107548B2	U.S.	Digital broadcast transmitting/receiving system having an improved receiving performance and signal processing method thereof	2009.10.01	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
8	US8050347B2	U.S.	Digital broadcast transmitting/receiving system having an improved receiving performance and signal processing method thereof	2009.10.01	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
9	US8199839B2	U.S.	Digital broadcast transmitting/receiving system having an improved receiving performance and signal processing method thereof	2009.10.01	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
10	US7920651B2	U.S.	Joint symbol, amplitude, and rate estimator	2009.06.25	BAE SYSTEMS INFORMATION AND ELECTRONICS SYSTEMS INTEGRATION, NC	COLLIDON COMMUNICATIONS, INC., NEW HAMPSHIRE
11	US7827466B2	U.S.	Rate matching method in mobile communication system	2009.03.06	LG ELECTRONICS INC.	LG ELECTRONICS INC.
12	US7814390B2	U.S.	Rate matching method in mobile communication system	2009.03.06	LG ELECTRONICS INC.	LG ELECTRONICS INC.
13	US7814391B2	U.S.	Rate matching method in mobile communication system	2009.03.06	LG ELECTRONICS INC.	LG ELECTRONICS INC.
14	US7697487B2	U.S.	Physical layer processing for a wireless communication system using code division multiple access	2009.01.15	NTERDIGITAL TECHNOLOGY	NTERDIGITAL TECHNOLOGY
15	US7590203B2	U.S.	Joint symbol, amplitude, and rate estimator	2008.10.15	BAE SYSTEMS INFORMATION & ELECTRONIC SYSTEMS INTEGRATION, NC.	COLLIDON COMMUNICATIONS, INC., NEW HAMPSHIRE



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No	Patent No	Country	Title Of The Invention	Filing Date	Applicant	Assignee
16	US7583757B2	U.S.	Joint symbol, amplitude, and rate estimator	2008.10.15	BAE SYSTEMS INFORMATION & ELECTRONIC SYSTEMS INTEGRATION, NC.	COLLIDON COMMUNICATIONS, INC., NEW HAMPSHIRE
17	US20110283169A	U.S.		2008.08.22		
18	US7590187B2	U.S.	Digital broadcasting transmission and/or reception system to improve receiving performance and signal processing method thereof	2008.07.18	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
19	USRE041753E	U.S.	Method for matching rate in mobile communication system	2008.06.03	LG ELECTRONICS, NC.	LG ELECTRONICS, NC.
20	US20090268843A	U.S.		2008.04.25		
21	US8073016B2	U.S.	Apparatus and method for channel coding and multiplexing in CDMA communication system	2008.04.22	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
22	USRE041590E	U.S.	Method for matching rate in mobile communication system	2008.03.31	LG ELECTRONICS, NC.	LG ELECTRONICS, NC.
23	US8347188B2	U.S.	Error correction methods and apparatus for mobile broadcast services	2008.02.27	SPREADTRUM COMMUNICATION CO. LTD.	SPREADTRUM COMMUNICATIONS CO., LTD.
24	US8064525B2	U.S.	Method and apparatus for transmitting data frames, and a method and apparatus for data rate matching	2007.12.13	SIEMENS AKTIEGESELLSCHAFT	SIEMENS AKTIEGESELLSCHAFT
25	WO2008085596A	World Intellectual Property Organization (WIPO) (International Bureau of)		2007.11.01		
26	US8111621B2	U.S.	Method for configuring a telecommunication system	2007.10.30	RESEARCH IN MOTION	RESEARCH IN MOTION
27	US7855964B2	U.S.	Communication method and apparatus and base station	2007.10.30	MITSUBISHI ELECTRIC	RESEARCH IN MOTION
28	US7864680B2	U.S.	Communication apparatus and method	2007.10.30	MITSUBISHI ELECTRIC	RESEARCH IN MOTION
29	WO2008060040A	World Intellectual Property Organization (WIPO) (International Bureau of)		2007.10.19		
30	US8074143B2	U.S.	Detection, avoidance and/or correction of problematic puncturing patterns in parity bit streams used when implementing turbo codes	2007.10.12	INTERDIGITAL TECHNOLOGY	INTERDIGITAL TECHNOLOGY
31	US8223854B2	U.S.	Method and apparatus for transmission of uplink control signaling and user data in a single carrier orthogonal frequency division multiplexing communication system	2007.09.25	MOTOROLA MOBILITY, NC	MOTOROLA MOBILITY, NC
32	US7792022B2	U.S.	Method and apparatus for de-rate matching in communication system	2007.08.10	ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE
33	US8074155B2	U.S.	Tail-biting turbo coding to accommodate any information and/or interleaver block size	2007.07.30	BROADCOM	BROADCOM
34	US7568058B2	U.S.	Rate matching apparatus, systems, and methods	2007.07.12	INTEL CORP	INTEL CORP
35	US8332734B2	U.S.	Rate matching device and method for a data communication system	2007.05.14	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
36	US7987414B2	U.S.	Rate matching device and method for a data communication system	2007.05.14	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
37	US8028222B2	U.S.	Apparatus and method for improving turbo code performance in a communication system	2006.10.12	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD., KOREA

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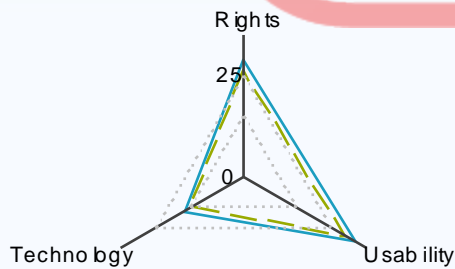
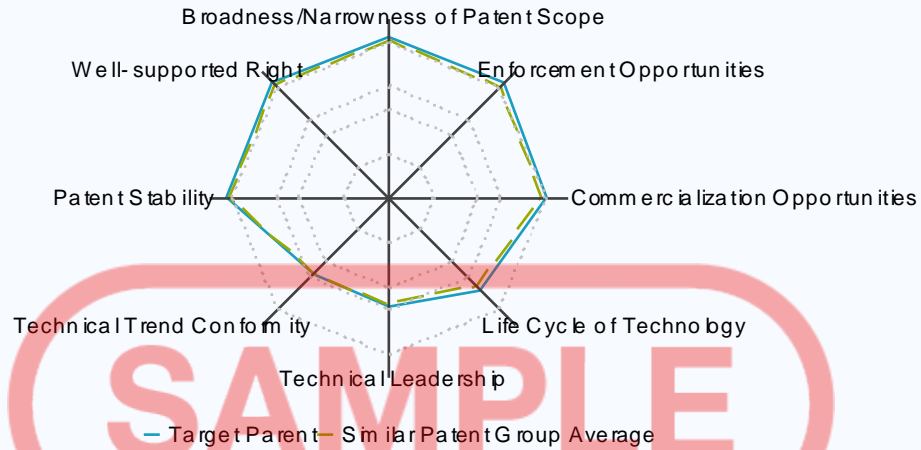
Evaluation Model : electric/electronic/IT

No	Patent No	Country	Title Of The Invention	Filing Date	Applicant	Assignee
38	US8019011B2	U.S.	Digital broadcast transmitting/receiving system having an improved receiving performance and signal processing method thereof	2006.07.12	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD.
39	US7627803B2	U.S.	System and method for variable forward error correction (FEC) protection	2006.07.05	HARRIS CORP	HARRIS CORP
40	US7712012B2	U.S.	Method of configuring transmission in mobile communication system	2006.06.29	LG ELECTRONICS INC.	LG ELECTRONICS INC., KOREA
41	US8271848B2	U.S.	Method of decoding code blocks and system for concatenating code blocks	2006.04.06	ALCATEL LUCENT	CREDIT SUISSE AG
42	US8116198B2	U.S.	Method for configuring a telecommunication system	2005.10.04	RESEARCH IN MOTION	RESEARCH IN MOTION
43	US7636878B2	U.S.	Method of configuring transmission in mobile communication system	2005.09.22	LG ELECTRONICS INC.	LG ELECTRONICS INC.
44	US7698623B2	U.S.	Systems and methods for decreasing latency in a digital transmission system	2005.08.12	HEDBERG DAVID	INTELLECTUAL VENTURES I, LIMITED LIABILITY COMPANY
45	US7590920B2	U.S.	Reduced complexity error correction encoding techniques	2005.08.05	HITACHI GLOBAL STORAGE TECHNOLOGIES NETHERLANDS, B.V.	HGST NETHERLANDS B.V.
46	US7773518B2	U.S.	Method for configuring a telecommunication system	2005.07.26	MITSUBISHI ELECTRIC	RESEARCH IN MOTION
47	US7773684B2	U.S.	Digital broadcasting transmission and/or reception system to improve receiving performance and signal processing method thereof	2005.05.04	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD., KOREA
48	US7593474B2	U.S.	Digital broadcast transmitting/receiving system having an improved receiving performance and signal processing method thereof	2005.01.10	SAM SUNG ELECTRONICS CO., LTD.	SAM SUNG ELECTRONICS CO., LTD., KOREA
49	US7613985B2	U.S.	Hierarchical trellis coded modulation	2004.10.22	KANOS COMMUNICATIONS	KANOS COMMUNICATIONS
50	US7424111B2	U.S.	System and method of applying parity bits to protect transmitting and receiving data	2004.08.17	SUNPLUS TECHNOLOGY CO., LTD.	SUNPLUS TECHNOLOGY CO., LTD.

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## Similar Patent Analysis

### Comparison of Scores by Evaluation Item in Similar Patent Group



	Target Patent	Average	Deviation
Total	77.7	70.7	3.9
Strength of Patent Right	29.1	26.5	2.6
Quality of Technology	17.0	15.0	0.9
Usability	31.6	29.1	1.6

— Target Patent — Similar Patent Group Average

### Applicant in Similar Patent Group

#### Similar Patent Applicant List

Applicant	No. Similar Patent	Possession Rate (%)
SAM SUNG ELECTRONICS CO., LTD.	11	11.0
QUALCOMM INCORPORATED	9	9.0
DIGITAL FOUNTAIN, NC.	7	7.0
Sam sung Electronics Co., Ltd	5	5.0
ARUZE GAMING AMERICA, NC.	2	2.0
Apple Computer, Inc.	2	2.0
Apple Inc.	2	2.0
Electronics and Telecommunications Research Institute	2	2.0
Indian Institute of Science	2	2.0

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App licant	No. Sim ilar Patent	Possession Rate(%)
Intel Corporation	2	2.0
LG Electronics Inc.	2	2.0
Qualcomm , Incorporated	2	2.0
Telefonaktiebolaget LM Ericsson (pub l)	2	2.0
Universal Entertainment Corporation	2	2.0
Aristocrat Technologies Australia Pty Limited	1	1.0
Board of Trustees of the Leland Stanford Junior University	1	1.0
Broadcom Corporation	1	1.0
CORTNA SYSTEM S, NC.	1	1.0
D igital Fountain Inc.	1	1.0
EDWARDS PAUL	1	1.0
GOLITSCHKE EDLER VON ELBW ART A	1	1.0
General Instrument Corporation of Delaware	1	1.0
HAMAMOTO KATSUJAKI	1	1.0
HAUSKE FABIAN N KOLAUS	1	1.0
Hew lett-Packard Development Company, LP.	1	1.0
H itachi Global Storage Technologies Netherlands B.V.	1	1.0
H itachi, Ltd.	1	1.0
GT	1	1.0
INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE	1	1.0
In teD igital Technology Corporation	1	1.0
Interactive Silicon, Inc.	1	1.0
In temational Business Machine Corporation	1	1.0
KON NKLIKE PH ILIPS ELECTRON IC, N.V.	1	1.0
Korean Advanced Institute of Science & Technology	1	1.0
LN HSIEN-CHUNG	1	1.0
Lucent Technologies Inc.	1	1.0
MATSUMURA YOSH NOBU	1	1.0
M atshu ita Electric Industrial Co., Ltd.	1	1.0
M icronas Sem iconductors, Inc.	1	1.0
M icrosoft Corporation	1	1.0
M itsub ish i Electric Corporation	1	1.0
M otorola, Inc.	1	1.0
Next Level Communications, Inc.	1	1.0
Nokia Corporation	1	1.0
Nokia Siemens Networks Oy	1	1.0
PANASON IC CORPORATION	1	1.0
PANTECH W RELESS, NC.	1	1.0



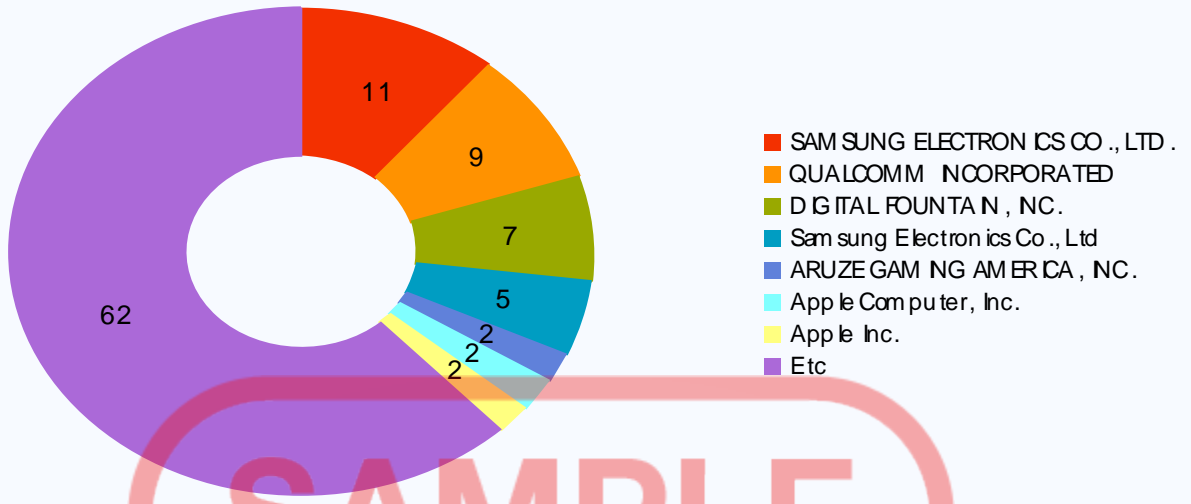
Title of The Invention : device and methods for channel coding and rate matching in a communication system  
 Appl.No : 09326891 Patent No : 06397367  
 Evaluation Model : electric/electronic/IT

Applicant	No. Similar Patent	Possession Rate(%)
QUAN TAI	1	1.0
RAAF BERNHARD	1	1.0
SHOKROLLAH IM AM N	1	1.0
STEW ART KENNETH A	1	1.0
STM icroe lectron ics SA	1	1.0
Sam sung Electron ics, Co., Ltd.	1	1.0
Silicon Im age	1	1.0
Skyworks So lutions, Inc.	1	1.0
Sun M icrosystem s, Inc.	1	1.0
TAO OLME	1	1.0
Thom son Licensing	1	1.0
U.S. Phillips Corporation	1	1.0
Valens Sem iconductor Ltd.	1	1.0
Vitesse Sem iconductor Corporation	1	1.0
YAZAK I CORPORAT DN	1	1.0
<b>Total</b>	<b>100</b>	<b>100%</b>

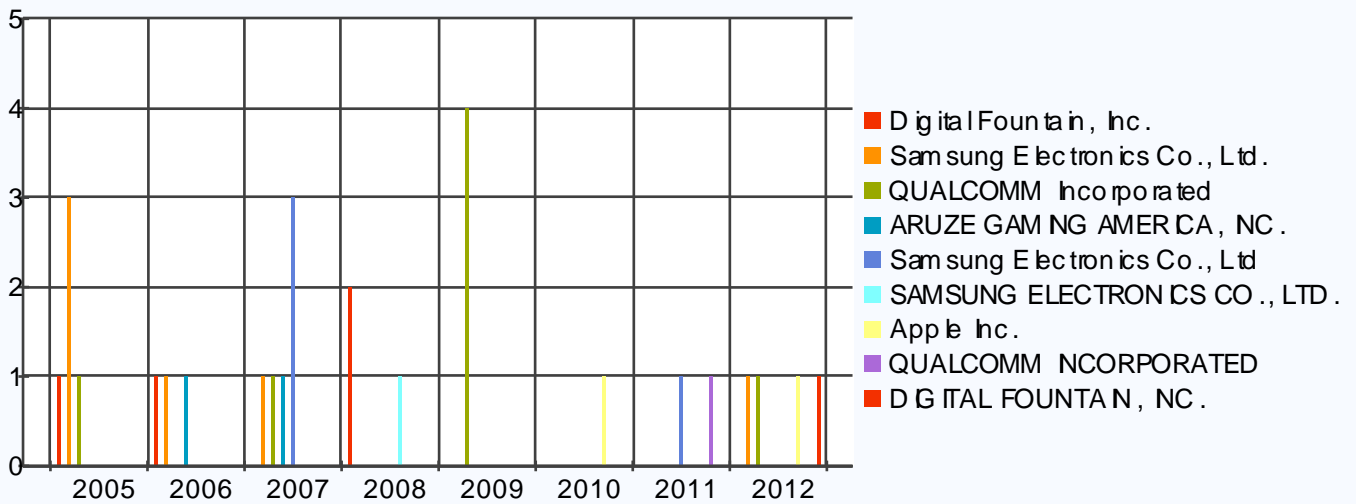


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Applicant Distribution



Similar Patent Application Trend by Applicant and Yearly



Registration of patents in the technical field closely related to the target patent began from 1996 year, and it is still increasing. Samsung Electronics, Co., Ltd. occupies 1% in the similar patent and it has little influence with the related technical field.

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### Similar Patent List

No	App I.No	Title of The Invention	Relevance Score	Applicant	Type
1	10967119	Device and methods for channel coding and rate matching in a communication system	1197	Sam sung Electron ics Co ., Ltd	Issued Patent
2	11020768	Channel coding method and device	460	SAM SUNG ELECTRON CS CO ., LTD .	Publication
3	12435120	Method and system for symbol detection using sub-constellations	362	Qualcomm Incorporated	Issued Patent
4	09126664	Apparatus and methods for puncturing and recovering code in spread spectrum communication system	361	Sam sung Electron ics Co ., Ltd.	Issued Patent
5	12451205	Data modulation in a communication system	314	Nok ia Siemens Networks Oy	Issued Patent
6	11626522	Apparatus and method of dynamically caching symbols to manage a dictionary in a text image coding and decoding system	285	Sam sung Electron ics Co ., Ltd.	Issued Patent
7	13766510	GAM NG SYSTEM AND METHOD OF GAM NG	265	Aristocrat Technologies Australia Pty Limited	Publication
8	09476436	Device and method for convolutional encoding in digital system	264	Sam sung Electron ics, Co ., Ltd.	Issued Patent
9	13254954	OFDM TRANSM ITER DEV ICE, OFDM TRANSM ISSION METHOD , OFDM RECEIVER DEV ICE, AND OFDM RECEPTION METHOD	257	MATSUM URA YOSH NOBU	Publication
10	11649585	Apparatus and method for symbol mapping TFCI bits for a hard split mode in a CDMA mobile communication system	246	Sam sung Electron ics Co ., Ltd	Issued Patent
11	10190645	Apparatus and method for symbol mapping TFCI bits for a hard split mode in a CDMA mobile communication system	243	Sam sung Electron ics Co ., Ltd.	Issued Patent
12	10741184	Method and apparatus for puncturing code symbols in a communications system	243	QUALCOMM Incorporated	Issued Patent
13	11295119	Method for generating codeword using repetition	237	Sam sung Electron ics Co ., Ltd.	Issued Patent
14	10915701	Data transmission method and receiver	235	Nok ia Corporation	Issued Patent
15	13288865	METHODS AND APPARATUS FOR LOW COMPLEXITY SOFT-INPUT SOFT-OUTPUT GROUP DETECTION	234	QUALCOMM INCORPORATED	Publication
16	12252331	ERROR-CORRECTING MULTI-STAGE CODE GENERATOR AND DECODER FOR COMMUNICATION SYSTEMS HAVING SINGLE TRANSM ITERS OR MULTIPLE TRANSM ITERS	234	Digital Fountain, Inc.	Publication
17	10374846	System and method for replacing bitstream symbols with intermediate symbols	225	TAO OLME	Publication
18	09780497	Vehicle compartment radio LAN system	219	YAZAKI CORPORATION	Publication
19	10112401	Apparatus and method for efficiently distributing energy over a packet data channel in a mobile communication system for high rate packet transmission	217	Sam sung Electron ics Co ., Ltd.	Issued Patent
20	11641613	Method for ciphering data with error correction code	216	STM icroelectron ics SA	Issued Patent

Similarity Distribution of overall patent : Average (228.18), Median (201), Maximum (4527)  
 Similarity Distribution of 100 Similar Patents : Average (216.4), Median (193.5), Maximum (1197.0)

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# Attachment

## Evaluation Factor

### ■ Strength of Patent Right (40)

#### ● Broadness/narrowness of Patent Scope (20)

It means whether the claim scope is broad or narrow. The fewer the limitations in a claim, the more likely it is that the claim scope is broad.

#### ● Well-supported Right (20)

It means whether or not patent right is protected in various fields faithfully and patent specification describes technique specifically and deeply. If there is a sufficient number of independent claims, are various categories of independent claims, such as apparatus and method, and the patent specification has been drafted in a broad and detailed manner, it would be a well-supported patent right.

#### ● Patent Stability (-20)

The patent stability means whether the patent can not be invalidated. The patent stability is high if a number of prior arts have been cited for the prosecution until the patent was issued and/or if there was any action to invalidate the patent by someone but the patent is still maintained.

### ■ Quality of Technology (20)

#### ● Technical Trend Conformity (5)

It means whether the target patent falls within a field of technology that is very active in research and development. In case research of related technical field is active in domestic/overseas in the light of prior patent/thesis and etc., the patent would conform to the technical trend.

#### ● Technology Leadership (5)

It means whether a target patent leads research and development. A target patent having a filing date that is considerably prior to those of most closely related patents is considered as a lead technology.

#### ● Life Cycle of Technology (10)

The technology life cycle means the timeline for which the technology would last to yield a profit. A larger number of forward citations indicates a long lifecycle of the technology related to the target patent.

### ■ Usability (40)

#### ● Commercialization Opportunities (20)

It means whether a target patent has been used in production of the patentee's own company or third party companies, or is expected to be used in the near future. The higher number of closely related patents and the higher number of maintenance fee payments for the target patent, the higher commercialization opportunities index becomes.

#### ● Enforcement Opportunities (20)

It means whether a target patent is more likely to be enforced against a third party. The enforcement opportunities index would increase if the target patent has a broad and clear claim scope so as to be easy to prove infringement and has a positive history of prior disputes.